

IN THE INTERNATIONAL BUREAU OF THE  
WORLD INTELLECTUAL PROPERTY ORGANIZATION

In re Applicant: CHAHROUDI, Day  
International Filing No.: PCT/US04/10979  
International Filing Date: 09 April 2004  
Agent's File No.: 63463.000003  
Title: PREPARATION OF LIGHT VALVES

PCT Receiving Office Section  
34, chemin des Colombettes  
1211 Geneva 20  
Switzerland

Dear Sirs:

**RESPONSE TO INTERNATIONAL SEARCH REPORT AND  
WRITTEN OPINION OF THE SEARCHING AUTHORITY  
ALONG WITH TRANSMITTAL OF ARTICLE 19 AMENDMENT**

In response to the International Search Report and Written Opinion of the International Searching Authority, mailed on January 28, 2005, the Applicant hereby provides the following Comments and Amendments to Claims 18, 30, 45 and 47 pursuant to Article 19(1) of the Patent Cooperation Treaty. Claims 1-17, 19-29, 31-44 and 46 have not been amended. In addition, the Applicant adds new Claims 47 and 48, support for which can be found in the Specification in "Step 7" of the "Manufacturing Procedures" on page 19.

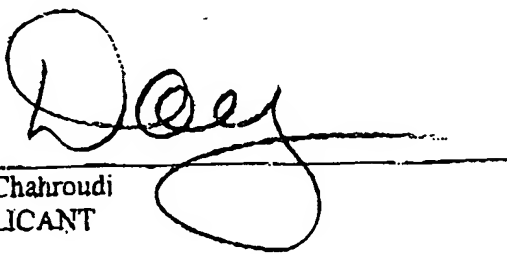
Pursuant to Article 19(3) no new matter has been added as a result of the Claim Amendments and therefore the Amendments do not go beyond the disclosure in the application as filed.

Attached hereto are Comments by the Applicant responding to the Examiner's findings on Pages 4-6 of the Written Opinion and Replacement Pages 27, 28, and 30 of the application for filing with the above referenced international application.

The Applicant respectfully requests that the Amended Claims be transmitted to the designated national offices pursuant to Article 20(2) and be published pursuant to Rule 48.2(h)

A courtesy copy of this paper is being concurrently filed with the U.S. Patent and Trademark Office as Receiving Office and International Searching Authority for the above-referenced international patent application.

Respectfully submitted,

By:   
Day Chahroudi  
APPLICANT

10/552758

**Informal Comments in Response to the Examiner's Citations and Explanations  
in the Written Opinion of the International Searching Authority**

JC09 Rec'd PCT/PTO 11 OCT 2005

1. The forms of Claims 18, 45, and 47 have been changed in accordance with the examiner's instructions.

2. Re: novelty of Claims 1 and 14: in Byker et al. (col. 12, In. 14-17): The polymer is not optically active (e.g. thermochromic) and the optically active material is not a polymer, whereas in Chahroudi's application, Claim 1, "the optically active layer consisting of: a polymer dissolved in a solvent". Byker (col. 9, In. 32-40, or anywhere else) does not disclose a "polymer and solvent reversibly forming finely divided separate phases" as the examiner states. Byker's optical shutter is based on small, optically active, dye molecules suspended in an optically inactive medium of polymer solution. Chahroudi Claim 14 depends on his Claim 1.

3. Re: inventive step of Claims 2 and 3: Byker (col. 12, In. 15-20, and col. 10, In. 15-20): there is no mention of "said monomer" which examiner refers to, or to "temperature low enough" or "phase separation", which examiner quotes from Chahroudi. Byker (col.12, In. 30-38): the polymer formed is not thermochromic, as in Chahroudi, Claim 1. Byker (col. 12, In. 45-47): again, Chahroudi's polymer is the optically active layer.

Byker (col. 12, In. 37-40): again, Byker's polymer gel is not optically active. Including a "crosslinking monomer with a functionality of two or more" does not "reduce the amount of additives", as the examiner claims.

Chahroudi Claims 19-23 have nothing to do with the optically active layer

Re: inventive step of Chahroudi Claims 4-13, 15-17, and 19-23, the examiner states that "varying solvents, additives and chemical composition" have all been disclosed by Byker. But this is also how most chemical products are developed. Chahroudi claims only very specific ingredients which took many years to develop.

Chahroudi Claims 19-23 are for a sealant formulation, and are not "thermochromic", "or reflect...light".

Re: inventive step of Chahroudi Claim 18: This claim is limited to the optical shutters of his Claim 1, unlike Byker (col.1, In. 46-49).

Re: novelty of Chahroudi Claim 24: Tonazzi's independent claims 1 and 8 utilize a vacuum and one or two "evacuation cavities" to fill said "cell cavity", while his only other independent Claim (14) includes "first and second support member(s)", (Tonazzi col. 13, In. 1-5). Chahroudi's Claim 24 includes neither a vacuum or a support member. Chahroudi Claims 27, 28, 39, and 47 depend on his Claim 24. Further, unlike Chahroudi claim 47 of processes useful for making optically active materials which reflect light, and are thus useful architecturally, Tonazzi teaches only optically active materials which absorb light and are thus not useful to "control unwanted solar heat".

Chahroudi Claim 29 depends on his Claim 24; further, there are hundreds of silanes, and only a vinyl silane works.

Chahroudi Claim 30 teaches "cover sheets are heated to [chemically] bond silane". whereas Tonazzi (col. 8, In. 20-25) is using heating the mold for the completely unrelated purpose of reducing the viscosity of the fluid being injected. To further distinguish Chahroudi Claim 30 from Tonazzi, it has been amended.

Re: Chahroudi Claim 31: Tonazzi does not give a reason for cooling cover sheets; his specification describes only heating. In contrast, for Chahroudi's invention, cooling is essential (see his specification, paragraph 013).

Re: Chahroudi Claim 32: Tonazzi does not teach cooling the liquid before injecting.

Re: Chahroudi Claims 33 and 34: Tonazzi uses "pressurized gas and/or vacuum" only to "force the solution out of the cell", whereas Chahroudi "flushes with an inert gas" only because air inhibits polymerization.

Re: Chahroudi Claim 35: Tonazzi does not teach removing dissolved gasses from the liquid.

Re: Chahroudi Claim 36: Tonazzi does not teach more than one pump because he only injects one fluid, while Chahroudi always injects two or more fluids.

Re: Chahroudi Claim 37: Tonazzi does not teach "slot die(s) or hollow needle(s)".

Re: Chahroudi Claim 38: Tonazzi does not teach a "tilting top table".

Re: Chahroudi Claim 42, Tonazzi does not teach a second, "outer", "durable mechanical connection", or one formed "after said liquid has become said solid."

Re: Chahroudi Claims 40 and 43: as the examiner states, Tonazzi does not teach "a sealant that softens or melts upon heating" (a "hot melt" adhesive). Further, Tonazzi (col. 13, ln. 29) teaches only a "sealant mixed with spacers". Tonazzi's "epoxy" and Chahroudi's hot melt sealants are applied with completely different machinery, and result in a completely different manufacturing process.

Re: Chahroudi Claim 41: Since Tonazzi and Byker do not disclose a hot melt adhesive for the seal, they can not disclose a preferred method for applying it. Byker (col. 27, ln. 66 to col. 28, ln.3) does not disclose making a spacer around the cover sheet's edges with a sealant, but rather bonding the entire surface of one cover sheet to the other cover sheet; that is, laminating the entire surface of the sheets together rather than forming said cavity between them.

Re: Chahroudi Claims 44 and 45: As the examiner states, neither Tonazzi nor Crawford teach a sealant made with "a saturated hydrocarbon...polymer" with "crosslinking", as this is novel.

**Replacement Sheet**

16. The light valve of Claim 15, characterized in that:

said catalyst is a persulfate salt plus a metabisulfite salt.

17. The light valve of Claim 1, characterized in that:

the light valve is stabilized against aging by oxygen and/or ultraviolet light by the addition of a hindered amine stabilizer which is soluble in said polymer dissolved in said solvent.

[Amended] 18. The light valves of Claims 1 through 14 or 16 or 17, characterized in that:

they are used to make architectural glazings that control unwanted solar heat or glare.

19. A sealant made from a saturated hydrocarbon rubber polymer characterized in that:

the polymer has an average functionality of two or more in order to form crosslinks, optionally by reacting said polymer functionality with a crosslinker which has a functionality of two or more, and which is soluble in said polymer.

20. The sealant of Claim 19, characterized in that:

said polymer functionality is hydroxy.

21. The sealant of Claim 19, characterized in that:

said crosslinker functionality is isocyanate.

22. The sealant of Claim 21, characterized in that:

said isocyanate is trimethyl hexamethylene diisocyanate.

23. The sealant of Claim 19, characterized in that:

a hindered amine stabilizer with functionality that chemically bonds it to said polymer, is added.

24. A process for making light valves consisting of:

forming a seal between two cover sheets at the circumference of the smaller sheet, optionally with fill and vent ports in the seal, and with the seal spacing apart the cover sheet, thus forming a cavity, characterized by:

**Replacement Sheet**

injecting into said cavity a liquid which then becomes a solid layer, with the solid layer having a variable transmission of light.

25. The process of Claim 24, characterized in that: any of the previously claimed materials are used.

26. The process of Claim 24, characterized in that: said liquid consists primarily of a monomer solution.

27. The process of Claim 24, characterized in that: said cover sheets are etched to improve the adhesion between said cover sheet and said solid layer.

28. The process of Claim 24, characterized in that: a silane is applied to said cover sheet to improve the adhesion between said cover sheet and said solid layer.

29. The process of Claim 28, characterized in that: said silane is a vinyl silane.

[Amended] 30. The process of Claim 28, characterized in that: said cover sheets are heated to bond said silane to said cover sheets before said injecting.

31. The process of Claim 24, characterized in that: said cover sheets joined with said seal are cooled before and/or during said injecting and/or the said liquid becoming said solid, in order to prevent the heat thereby released from reducing said light valve's optical performance or resistance to aging.

32. The process of Claim 24, characterized in that: said liquid is cooled before said injecting in order to prevent the heat released from said liquid becoming said solid from reducing said light valve's optical performance or resistance to aging.

33. The process of Claim 24, characterized in that: said cavity is flushed with an inert gas before said liquid is injected into said cavity to prevent incomplete polymerization, or bubble formation in said solid.

34. The process of Claim 33, characterized in that: the inert gas is selected from: nitrogen, argon, and preferably helium.

**Replacement Sheet**

44. The process of Claim 42, characterized in that:  
said outer seal is made with a sealant based on a saturated hydrocarbon liquid or solid polymer, with functionality for crosslinking.

[Amended] 45. The process of Claims 19 through 23, ~~and~~ or 42, characterized in that:  
said outer seal is made from ~~the~~ a sealants previously claimed.

46. The process of Claim 24, characterized in that:  
said light valve is made on production machinery that has been designed for making sealed double pane windows, and that has been modified for making said cavity thinner, and has been added on to enable injecting said liquid into said cavity.

[Amended] 47. The processes of Claims 24 through 44 or 46, characterized in that:  
they are used to make architectural glazings that control unwanted solar heat or glare.

[New] 48. The process of Claim 24 characterized in that:  
some of the apparatus for preparing said liquid for said injecting,  
and/or for injecting said liquid,  
is contained within a cooling chamber.

[New] 49. The process of Claims 24, 31, or 38, characterized in that:  
said injecting is done on a tilting top table,  
and/or a cooled plate,  
and optionally enclosed within a cooling chamber.